UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,809	03/27/2007	Maurice Howard Fisher	1010-00400	6619

62763 7590 01/05/2009

Tod T. Tumey
P.O. BOX 22188
HOUSTON, TX 77227-2188

EXAMINER	
INGHAM, JOHN C	
ART UNIT	PAPER NUMBER
2814	
MAIL DATE	DELIVERY MODE
01/05/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/597,809	FISHER ET AL.	
	Examiner	Art Unit	
	JOHN C. INGHAM	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13-17 and 19-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13-17 and 19-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/806;3/8/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim **6** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim recites that the ratio (first material to second material) increases between points disposed intermediate said layer. However, this scenario is not described in the specification and only a decreasing ratio is described. The claim is interpreted to mean that the ratio (first material to second material) decreases between points disposed intermediate said layer.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims **1-11, 13-16 and 19-22** are rejected under 35 U.S.C. 102(b) as being anticipated by Mizushima (US 2002/0017642).

5. Regarding claims **1 and 13**, Mizushima discloses in Fig 7 a semiconductor device and a method of manufacture comprising a substrate (Fig 1 item 1) of a first semiconductor material (Si) and a compound layer (Fig 1 item 2) of said first semiconductor material and a second semiconductor material (SiGe) disposed on the substrate, the ratio of the first material to the second material of the compound layer being decreased (q3, Si decreases) away from the substrate towards the upper surface of the compound layer, wherein the rate of decrease of the ratio varies within said layer (rate of Si decrease in q2 is different than rate of Si decrease in q3).

6. Regarding claims **2 and 14**, Mizushima discloses in Fig 7 the device of claims 1 and 13, in which the rate of decrease of the ratio increases away from the substrate towards the surface of the compound layer (rate of q2 is less than rate of q3).

7. Regarding claims **3, 15, 19 and 21**, Mizushima discloses in Fig 7 the device of claims 1, 2, 13 and 14, in which the rate of decrease of the ratio varies linearly on opposite sides of an intermediate point disposed within said layer at which the rate varies (e.g. sloped rate of q2 is different than sloped rate of q3).

8. Regarding claims **4, 16, 20 and 22,** Mizushima discloses in Fig 7 the device of claims 1, 2, 13 and 14, in which the rate of decrease of the ration varies non-linearly within said layer (e.g. horizontal part of q2 is different than sloped part of q3).

9. Regarding claim **5**, Mizushima discloses in Fig 7 the device of claim 1, in which the ratio remains constant between points disposed intermediate said layer (e.g. horizontal part of q2).

10. Regarding claim **6 as best understood**, Mizushima discloses in the device of claim 1, in which the ratio *decreases* between points disposed intermediate said layer.

11. Regarding claim **7**, Mizushima discloses in Fig 7 the device of claim 1, in which a final layer (Fig 2 item 4) comprising said first material is deposited on the surface of the compound layer.

12. Regarding claims **8 and 9**, Mizushima discloses the device of claim 1, in which the first material is silicon and the second material is germanium.

13. Regarding claims **10 and 11**, Mizushima discloses the device of claim 1, in which the composition of the compound layer at the upper surface thereof (upper surface of SiGe at q3) comprises substantially 20% of said second material (Ge content is 0.225).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claim **17** is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizushima and Murthy (US 6,723,622).

17. Mizushima discloses the method of claim 13, but does not specify wherein the ratio of the first material to the second material of the compound layer is decreased in part by decreasing a temperature at which the layer is deposited from the substrate towards the surface of the compound layer.

18. Murthy teaches that decreasing the ratio of silicon to germanium in a graded composition layer (compound layer) is accomplished by also decreasing the temperature at which the layer is deposited, in order to produce a layer with low defect density (col 3 ln 8-13). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Murthy in order to produce a layer with low defect density.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN C. INGHAM whose telephone number is (571)272-8793. The examiner can normally be reached on M-F, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Howard Weiss/
Primary Examiner
Art Unit 2814

John C Ingham
Examiner
Art Unit 2814

/J. C. I./
Examiner, Art Unit 2814